Fletcher, even though their names may not be a series ascending in scientific distinction. The trustees had, however, planned to elect as director an executive officer of the museum without scientific qualification, passing over Dr. A. Smith Woodward, Dr. Harmer and other scientific men of the institution and of the country. They were prevented from doing so by vigorous protests from scientific men, a large number of leaders having, for example, signed a letter in which they said that to appoint a staff officer instead of a man of scientific standing would be "an affront to scientific men and of grave detriment to science."

The electing trustees of the British Museum are the Lord Chancellor, the Archbishop of Canterbury, and the Speaker of the House of Commons, and it is perhaps not surprising if they do not have expert qualifications for the conduct of a scientific institution. An English journal—*The Naturalist*—remarks: "In the old days when all our national collections were housed at Bloomsbury, and books and mummies were the chief attraction, a Chancellor, an Archbishop and a Speaker may have been a suitable tribunal. But science has made leaps and has bounded away to South Kensington since then, and the present government should see to it that the appointment of the director of the Natural History Museum is in the hands of men capable of judging the requirements of the post, instead of, as in the present case, attempting to give the honor to the person who salaams to them on the few occasions upon which they meet, and who has the privilege of recording the Great Words which issue from their Great Mouths."

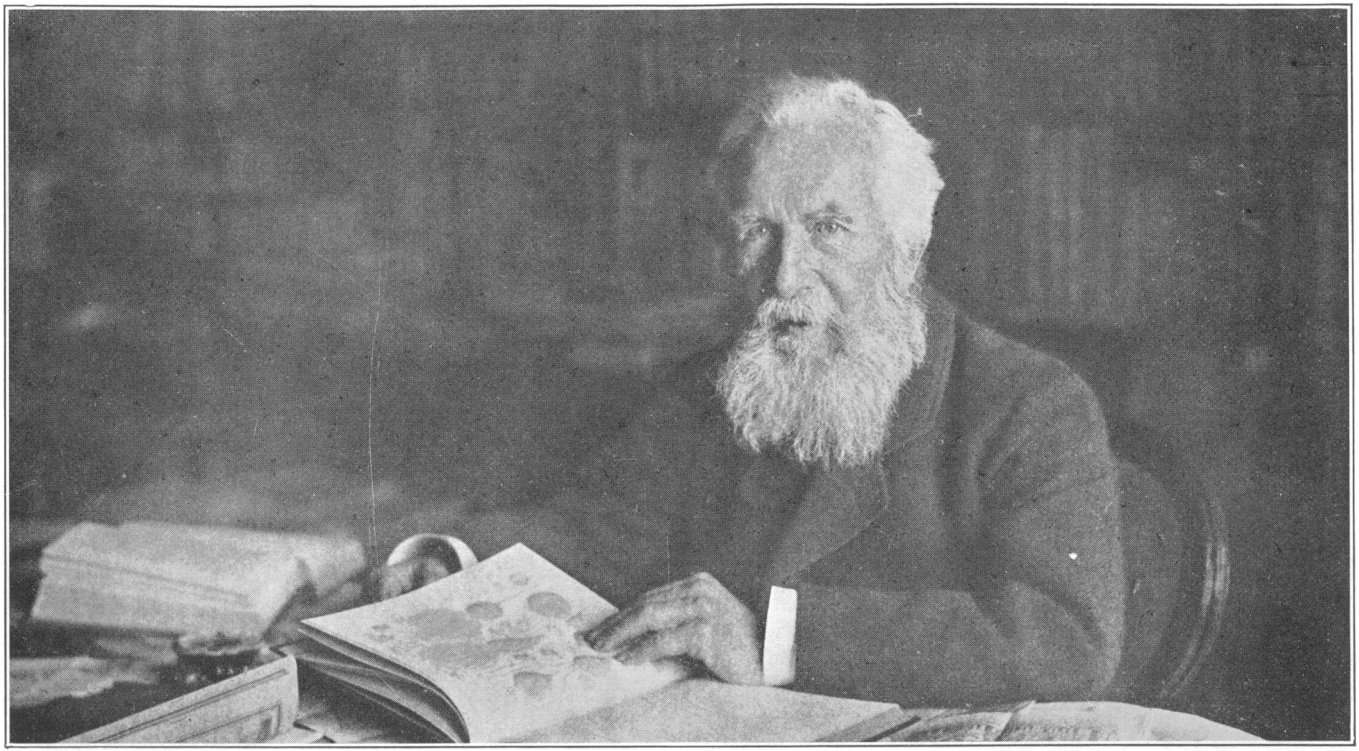
It might be well if we should learn from the English situation, for we have a National Museum, which is subsidiary to the Smithsonian Institution, whose regents are not scientific men. It now has a magnificent building and good collections; excellent scientific work is accomplished; but it has no director. Dr. G. Brown Goode, who was in charge as assistant secretary of the Smithsonian Institution, was an admirable museum administrator and he was worthily succeeded by the late Dr. Richard Rathbun. But there seems to be no movement to place the museum in control of a director eminent in science.

USE OF THE GEOPHONE BY THE BUREAU OF MINES

THE geophone, a listening instrument invented by the French during the war to detect enemy sapping and underground mining operations and for the location of enemy artillery, is now being used by the Bureau of Mines, Department of the Interior, as a possible aid in locating miners who have been entombed after a disaster. The instrument was developed by the United States engineers during the war and is now used by the bureau according to plans drawn by them.

Alan Leighton, assistant chemist of the bureau, who now has charge of these investigations, reports that the instrument, though small, is essentially a seismograph, since it works on the same principle as the ponderous apparatus with which earthquake tremors are recorded. It consists of an iron ring about three and a half inches in diameter, within the center of which is suspended a lead disk which is fastened by a single bolt through two mica discs, one of which covers the top and the other the bottom of the ring. There then are two brass cap pieces, the top one having an opening in its center to which is fastened a rubber tube, leading to a stethoscopic ear piece.

We then have really nothing but



ERNST HEINRICH HAECKEL,
Professor of zoology at the University of Jena since 1865, who has died at the age of eighty-five years.

a lead weight suspended between two mica discs cutting across a small air-tight box. If the instrument is placed on the ground and any one is pounding or digging in the vicinity, energy is transmitted as wave motion to the earth, and the earth-waves shake the geophone case. The lead weight, on account of its mass and because it is suspended between the mica remains comparatively motionless. There then is produced a relative motion between the instrument case and the lead weight. The result is that a compression and rarefaction of the air in the instrument takes place. Since the rubber tube leading to the stethoscopic ear piece is connected with this space in the geophone, this rarefaction and compression is carried to the ear drum. Usually two instruments are used, one for each ear.

When the two instruments are used, it has been found that the sound is apparently louder from the instrument nearer the source of the sound. It is evident then that by moving the instruments properly a point can be found when the sound will be of the same apparent intensity in both ears. The direction of the sound is then on a perpendicular to the line connecting the centers of the two instruments either in front of or behind the observer. Further observation will show which side. Direction is quite accurately determined in this way. The sound is not actually louder in one ear than in the other, but the ear is capable of distinguishing the difference in time at which the sound arrives in the two instruments.

During the period of the war, engineers of the Mining Division of the Bureau of Mines were engaged in determining the distance that different mining machines could be heard through the clay, shale, coal and the mine cover. Measurements were made also of the energy required in blows that they be heard definite distances through clay, shale and coal, as well as the distances at which the shock waves resulting from the discharge of various explosives could be heard. A brief investigation of the factors influencing the transfer of energy from a mining tool to the clay and coal was also made in order that recommendations could be made as to the type of mining machine which could be used to accomplish the most work with the least noise.

SCIENTIFIC ITEMS

WE record with regret the death of Emil Fischer, professor of chemistry in the University of Berlin, and Adrian J. Brown, professor of the fermentation industries at the University of Birmingham.

DR. JOHN CAMPBELL MERRIAM, professor of paleontology and historical geology in the University of California, who has been acting chairman of the National Council of Research, was elected president of the Pacific Division of the American Association for the Advancement of Science at the Pasadena meeting.—On the occasion of the seventieth birthday of Sir William Osler, regius professor at Oxford University and previously professor in the Johns Hopkins University, which occurred on July 12, he was presented with a collection of essays contributed by about one hundred of his pupils and colleagues.

GEORGE EASTMAN, head of the Eastman Kodak Company, has given the sum of $3,500,000 for the establishment of a school of music in connection with the University of Rochester. The school will aim to aid the development of an appreciation of the highest type of motion pictures as an ally of the highest type of music.